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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,262	06/29/2001	Alex Gammerman	211163	2977

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EXAMINER	
BELL, MELTIN	

ART UNIT	PAPER NUMBER
2121	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,262	GAMMERMAN ET AL.	
	Examiner	Art Unit	
	Meltin Bell	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *June 29, 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is responsive to application **09/831,262** filed June 29, 2001.

Claims **10-18 (amended)** have been examined.

Priority

Applicant is advised of possible benefits under 35 U.S.C. 119(a)-(d), wherein an application for patent filed in the United States may be entitled to the benefit of the filing date of a prior application filed in a foreign country.

Acknowledgment is made of applicant's claim for foreign priority based on application numbers

- PCT/GB99/03737 filed under 35 USC 371 on November 9, 1999, and
- 9824552.5 filed in the United Kingdom on **November 9, 1998**.

It is noted, however, that:

- The PCT application only has the first, codes and international search report related pages.
- The concept of data carrier introduced in this application on page 5, lines 5-7 is not reflected on page 5, lines 4-5 of the United Kingdom application.

Information Disclosure Statement

Applicant is respectfully reminded of the ongoing Duty to disclose 37 C.F.R. 1.56 all pertinent information and material pertaining to the patentability of applicant's claimed

invention, by submitting in a timely manner PTO-1449, Information Disclosure Statement (IDS) with the filing of applicant's application or thereafter.

The information disclosure statement filed May 8, 2001, fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- The 'Learning by Transduction' Non Patent Literature reference is missing the date of publication.
- The 'Uncertainty in Artificial Intelligence' Non Patent Literature reference is missing the month of publication. The copy and translation of the reference also don't support 1998 as the year of publication.

It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

Drawings

The United States Patent and Trademark Office of Draftperson's Patent Drawings Review have reviewed the formal drawings.

The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the drawings.

The drawings are objected to because:

- Figure items are not labeled (e.g. the data classifier of Figure 2 referred to on page 11, line 10).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

- Items 1 and 2 on pages 7, lines 2-4 are not shown in the Figures.

Appropriate correction is required.

It is also noted that the only abstract included is the one given on the first page of the PCT application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-18 are rejected under 35 U.S.C. 102(b) as being anticipated by *Mizuno* U.S. Patent Number 5,577,166 (November 19, 1996).

Regarding claim 10:

Mizuno teaches,

- an input device for receiving a plurality of training classified examples and at least one unclassified example (FIG. 3, item 23)

- a memory for storing said classified and unclassified examples (column 2, lines 54-59, "classification includes steps of...results of the comparison")

- an output terminal for outputting a predicted classification for said at least one unclassified example (FIG. 3, item 24)

- a processor for identifying the predicted classification of said at least one unclassified example (column 5, lines 42-51, "As shown in FIG.3...program module")

- a processor with classification allocation means for allocating potential classifications to each said unclassified example and for generating a plurality of classification sets, each said classification set containing said plurality of training classified examples and said at least one unclassified example with its said allocated potential classification (column 5, lines 42-51, "As shown in FIG.3...program module")

- assay means for determining a strangeness value valid under the iid assumption for each said classification set (column 5, lines 42-51, "As shown in FIG.3...program module"; column 7, lines 1-12, "FIG. 5 shows...training data")

- a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said strangeness values assigned by said assay means (column 2, lines 54-59, "classification includes steps of...results of the comparison"; column 9, lines 14-26 "an input pattern...to the user")

- a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs (column 10, lines 32-34, "The execution history monitoring...predetermined strategies"; Figure 6)

Regarding claim 11:

Mizuno further teaches,

- an example valuation device which determines individual strangeness values for each said training classified example and said at least one unclassified example having an allocated potential classification (column 9, lines 14-26 "an input pattern...to the user")

Regarding claim 13:

Mizuno further teaches,

- assay means determines a strangeness value for each said classification set in dependence on said individual strangeness values of each said example (column 9, lines 14-26 "an input pattern...to the user")

Regarding claim 14:

Mizuno further teaches,

- an input device for receiving a plurality of training classified examples and at least one unclassified example (FIG. 3, item 23)

- a memory for storing said classified and unclassified examples (column 2, lines 54-59, "classification includes steps of...results of the comparison")

- stored programs including an example classification program (FIG.3, item 15; column 7, lines 3-12, "In the training data file...the training data"; column 5, lines 42-51, "As shown in FIG.3...program module")

- an output terminal for outputting a predicted classification for said at least one unclassified example (FIG. 3, item 24)

- a processor controlled by said stored programs for identifying the predicted classification of said at least one unclassified example (column 5, lines 42-51, "As shown in FIG.3...program module")

- a processor with classification allocation means for allocating potential classifications to each said unclassified example and for generating a plurality of classification sets, each said classification set containing said plurality of training classified examples and said at least one unclassified example with its said allocated potential classification (column 5, lines 42-51, "As shown in FIG.3...program module")

- assay means for determining a strangeness value valid under the iid assumption for each said classification set (column 5, lines 42-51, "As shown in FIG.3...program module"; column 7, lines 1-12, "FIG. 5 shows...training data")

- a comparative device for selecting the classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification output by the output terminal is said most likely allocated classification according to said strangeness values assigned by said assay means (column 2, lines 54-59, "classification includes steps of...results of the comparison"; column 9, lines 14-26 "an input pattern...to the user")

- a strength of prediction monitoring device for determining a confidence value for said predicted classification on the basis of said strangeness value assigned by said assay means to one of said classification sets to which the second most likely allocated potential classification of said at least one unclassified example belongs (column 10, lines 32-34, "The execution history monitoring...predetermined strategies"; Figure 6)

Regarding claim 15:

Mizuno further teaches,

- inputting a plurality of training classified examples and at least one unclassified example (column 5, lines 42-51, "As shown in FIG.3...program module")

- identifying a predicted classification of said at least one unclassified example (column 5, lines 42-51, "As shown in FIG.3...program module")

- allocating potential classifications to each said unclassified example (column 2, lines 54-59, "classification includes steps of...results of the comparison")

- generating a plurality of classification sets, each said classification set containing said plurality of training classified examples and said at least one unclassified example with its allocated potential classification (FIG.3, item 15; column 7, lines 3-12, "In the training data file...the training data"; column 5, lines 42-51, "As shown in FIG.3...program module")

- determining a strangeness value valid under the iid assumption for each said classification set (column 5, lines 42-51, "As shown in FIG.3...program module"; column 7, lines 1-12, "FIG. 5 shows...training data")

- selecting the said classification set to which the most likely allocated potential classification for said at least one unclassified example belongs, wherein said predicted classification is the most likely allocated potential classification in dependence on said strangeness values (column 2, lines 54-59, "classification includes steps of...results of the comparison"; column 9, lines 14-26 "an input pattern...to the user")

- determining a confidence value for said predicted classification on the basis of the strangeness value assigned to one of said classification sets to which the second most likely allocated potential classification for said at least one unclassified example belongs (column 10, lines 32-34, "The execution history monitoring...predetermined strategies"; Figure 6)

- outputting said predicted classification for said at least one unclassified example and said confidence value for said predicted classification (FIG. 3, item 24; column 8, lines 49-54, "For the obtained jmin-th training data...notify the results to the user")

Regarding claim 16:

Mizuno further teaches,

- determining individual strangeness values for each said training classified example and said at least one unclassified example having an allocated potential classification (column 5, lines 42-51, "As shown in FIG.3...program module"; column 7, lines 1-12, "FIG. 5 shows...training data")

Regarding claim 17:

Mizuno further teaches,

- said selected classification set is selected without the application of any general rules determined from the said training set (column 2, lines 54-59, "classification includes steps of...results of the comparison"; column 9, lines 14-26 "an input pattern...to the user")

Regarding claim 18:

Mizuno further teaches,

- generating a plurality of classification sets, each said classification set containing a plurality of training classified examples and at least one unclassified example that has been allocated a potential classification (FIG.3, item 15; column 7, lines 3-12, "In the training data file...the training data"; column 5, lines 42-51, "As shown in FIG.3...program module")

- determining a strangeness value valid under the iid assumption for each said classification set (column 5, lines 42-51, "As shown in FIG.3...program module"; column 7, lines 1-12, "FIG. 5 shows...training data")

- selecting the classification set to which the most likely allocated potential classification for the said at least one unclassified example belongs, wherein the predicted classification is the most likely allocated potential classification in dependence on said strangeness values (column 2, lines 54-59, "classification includes steps of...results of the comparison"; column 9, lines 14-26 "an input pattern...to the user")

- determining a confidence value for said predicted classification on the basis of said strangeness value assigned to one of said classification sets to which the second most likely allocated potential classification for said at least one unclassified example belongs (column 10, lines 32-34, "The execution history monitoring...predetermined strategies"; Figure 6)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Office presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Office to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Mizuno* U.S. Patent Number 5,577,166 (November 19, 1996) in view of *Cortes et. al.* U.S. Patent Number 5,640,492 (June 17, 1997).

Regarding claim 12:

Mizuno teaches,

- storing distributions of the inputs, outputs and training data that include averages, standard deviations, minima and maxima (column 7, lines 3-12, "In the training data file...the training data")

However, *Mizuno* doesn't explicitly teach Lagrange multipliers while *Cortes et. al.* teaches,

- subsets of patterns representing intermediate solutions for individual strangeness values determined by Lagrange multipliers (column 10, lines 32-40, "The...intermediate solutions")

Motivation – The portions of the claimed apparatus wherein Lagrange multipliers are used to determine said individual strangeness values would have been a highly desirable feature in this art for

- Detecting abnormalities in the classification process (*Mizuno*, Abstract, "A method of and an apparatus...detect an abnormality thereof")
- Determining whether unclassified examples should be identified as members of a class (*Cortes et. al.*, column 2, lines 42-46, "A method is...processing program")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Mizuno* with *Cortes et. al.* to obtain the invention specified in claim 12, determining individual strangeness values by Lagrange multipliers. The modification would have been obvious because one of ordinary skill in the art would have been motivated to improve classification accuracy.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- *Mizuno*; U.S. Patent Number 5,577,166

- *Cortes et. al.*; U.S. Patent Number 5,640,492

- *Tsuboka* U.S. Patent Number 5,608,841

- *Keeler et. al.*; U.S. Patent Number 5,479,573

- *Vovk et. al.*; U.K. Patent Number GB 2 369 899 A

- *Borrey et. al.*; U.K. Patent Number GB 2 080 072 A

- *Sampson et. al.*; European Patent Publication Number 0 450 825 A2

- G.A. Carpenter, W.D. Ross; "ART-EMAP: A neural network architecture for object recognition by evidence accumulation"; IEEE Transactions on Neural Networks; Vol.6, Iss.4, July 1995; pp 805-818

- *C.H. Wu, G.M. Whitson, C.-T. Hsiao, C.-F. Huang*; "Classification Artificial Neural Systems for Genome Research";Proceedings of the 1992 ACM/IEEE Conference on Supercomputing; December 1992; pp 797-803

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anil Khatri, can be reached on 703-305-0282. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

MB

ANIL KHATRI
SUPERVISORY PATENT EXAMINER